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(A)

September 24, 1992

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Office of Toxic Substances
U.S. Environmental Protection Agency
401 M Street, SW
Washington, DC 20460

Attn: Section 8(e) Coordinator (CAP Agreement)

Re: CAP Agreement Identification No. 8ECAP-0110

Dear Sir or Madam:

Union Carbide Corporation ("Union Carbide") herewith submits the following report pursuant to the terms of the TSCA §8(e) Compliance Audit Program and Union Carbide's CAP Agreement dated August 14, 1991 (8ECAP-0110). This report describes an acute toxicity study with diethylene glycol monobutyl ether acetate (Butyl CARBITOL® Acetate; CASRN 124-17-4).

"Repeated Applications of Butyl "CARBITOL" Acetate to the Intact Rabbit Skin", Mellon Institute of Industrial Research (University of Pittsburgh), Report 5-71, 6/26/42.

A complete summary of this report is attached.

Previous TSCA Section 8(e) or "FYI" Submission(s) related to this substance are:

(None)

Previous PMN submissions related to this substance are: (None)

5-71

RECEIVED 9/1/95

This information is submitted in light of EPA's current guidance. Union Carbide does not necessarily agree that this information reasonably supports the conclusion that the subject chemical presents a substantial risk of injury to health or the environment.

In the attached report the term "CONFIDENTIAL" may appear. This precautionary statement was for internal use at the time of issuance of the report. Confidentiality is hereby waived for purposes of the needs of the Agency in assessing health and safety information. The Agency is advised, however, that the publication rights to the contained information are the property of Union Carbide.

Yours truly,

William C. Kuryla, Ph.D.
Associate Director
Product Safety
(203/794-5230)

WCK/cr
Attachment (3 copies of cover letter, summary, and report)

SUMMARY

MELLON INSTITUTE OF INDUSTRIAL RESEARCH
UNIVERSITY OF PITTSBURGH

Repeated skin application bad to kidneys

230-2-39 Agenda B(a) 33

SPECIAL REPORT [REPORT 5-71]

on (6-26-42)

B-27

REPEATED APPLICATIONS OF BUTYL "CARBITOL" ACETATE TO THE INTACT RABBIT SKIN

1. By Means of an Automatic Delivery Device

Carbide and Carbon Chemicals Corporation Industrial Fellowship No. 274-5

Of the 9 animals that died during the first 12 consecutive days of treatment 7 had bloody urine at autopsy which was attributed to gross kidney damage as the micropathology indicates. The occurrence of liver infections in about 40% of the treated and control animals is a condition which cannot be predicted before the animal is used. This is a common finding in rabbits and apparently if not too advanced it interferes very little with their normal life. BCA causes kidney damage primarily and the occurrence of somewhat weakened livers is therefore relatively unimportant. The finding of parasites in the mesenteries is also of little import since they were all walled off in lymph sacs and seemed to be in an inactive state.

Micropathology of the kidney was a consistent finding and appeared in varying degrees of severity. In the four survivors the pathology was of the nature of cloudy swelling of the convoluted tubules with a like effect in the loop tubules of three of these. In the animals dying toxic deaths this was intensified and in several there was definite tubular degeneration. Pathology of other organs is so mild that it is classed as secondary. Spleens of animals that died showed evidence of blood destruction. About 50% of the livers showed moderate or marked cloudy swelling.

UNIVERSITY OF PITTSBURGH

Agenda B(4) 230-2-39

repeated skin application led to Industrial damage

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1. By Means of an Automatic Delivery Device

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Our report 5-65, dated 6-10-42, gives our ideas of severe use of a military insect repellent, under Test D-3. This assumed-use was followed for the present work except that doses were applied over a 16 hour period instead of the 12 hour period specified in that report. This conflict is due to the fact that the rabbit work was started before our military use ideas were in final form.

Because butyl "Carbitol" acetate appeared the most effective repellent immediately available this test of repeated skin application in rabbits was performed.

To summarize the actual conditions of the tests reported below on rabbits, as compared to that proposed for humans, we may make the following statements in respect to the conditions postulated above.

First, by actual measurement of the area covered by BCA saturated with a blue dye, Calco oil Blue I. R. Base, under actual test conditions during one treatment, it was established that the dose spread over an average area of 26.3 square inches or 13.5% of the total 200 square inches body area of the rabbit. This is about 65% of the comparative area which was postulated for soldier use. Repeated applications to this somewhat smaller area would result in greater skin damage and therefore just as complete absorption as if it had been applied to a greater area in which case comparatively less damage to the skin would have occurred. Covering a larger area of skin will, of course, increase the rapidity of absorption but it does not

seem logical that it will increase the amount absorbed, when the dosage is in the order of magnitude used in the rabbit test.

Second, the average volume of repellent per square inch in this test was 0.277 cc. per square inch of rabbit skin as compared to the proposed 0.055 cc. per square inch for soldier use. This is 5 times as much per unit area.

Third, the doses were applied to the rabbit belly over a period of 16 hours at 1.6 hour intervals, just as planned for soldier use, but due to capillary resistance the individual doses were delivered over a 30 to 45 minute interval instead of in a single surge.

Provisions 4, 5, and 6 were followed as outlined previously without any variations. However, in terms of dosage in grams per kilo of body weight, the rabbits received 7 times that planned for man or 3.2 instead of the 0.47 grams per kilo postulated for soldier use. Therefore, it is concluded that, in view of all the factors mentioned above, the rabbit actually received 5 times as great an exposure as would the soldier and this in turn would nullify the supposed fact that the rabbit is 5 times as resistant as is man. Results as reported should be substantially of the same order of severity in human use, as near as is predictable.

Samples

The 5 gallon sample of butyl "Carbitol" acetate (BCA) used in this study was procured from South Charleston on 4-17-42 and was marked National Carbon grade. This was mixed in the proportion of 93% BCA and 7% Mazola Salad Oil from corn, purchased on the open market, in an effort to reduce skin irritation.

Methods

Twenty male albino rabbits and ten controls of 2.5 kilogram average weight were used in this study. They were kept under observation for a period of one month

to ascertain that all were healthy and gaining weight normally. Preliminary blood counts and blood urea nitrogen determinations were also made during this time.

Because of the time consuming nature of making applications to twenty rabbit bellies every 100 minutes during 16 hours and the necessity of preventing the rabbits from licking the repellent from their bodies an automatic dosing device was designed and fabricated. Figs. 1, 2, and 3 are various views of this apparatus and may be referred to for clarification of the following description.

The automatic delivery device consisted of a bottomless box 7 ft. long, 2 ft. deep and 8 inches high, divided by partitions into two main sections each containing five separate stalls for rabbits. The front side of the box was open so that rabbits would have their heads in fresh air continually. A fan was mounted in the center of each main section on the rear of the box so that air was pulled past the rabbit's head and over its body at the rate of about 30 linear feet per minute during the entire test period. The least air flow perceptible to the dry human skin is 180 linear feet per minute. This prevented inhalation of most of the vapors produced by evaporation of BCA from their warm bodies. The exposures were carried out in a large room equipped with an exhaust fan which changed the air in the room about once every eight or ten minutes. These precautions were considered as adequate protection against the inhalation of vapors which might possibly be of moment from a toxic standpoint during a 90 day exposure period of 16 hours per day.

The BCA was delivered by displacement of the fluid from sidearm reservoirs by carefully cut pieces of solid glass rod which displaced on the average 0.67 cc. of material each. The initial dose of 1.75 cc. was pipetted onto the closely clipped rabbit belly. For the delivery of the next nine doses of 0.67 cc. at 100 minute intervals a constant speed electric clock which turned a line shaft one complete

revolution in 24 hours was utilized. The line shaft was fitted with individual discs for each of the ten stalls. Each of these discs was fitted with 9 fingers to carry the glass rods which were to be deposited in the reservoir at 100 minute intervals during the remainder of the dosing period. By the precise placing of these 9 fingers it was possible to have them deposit the glass rods at approximately 100 minute intervals, thus causing the fluid BCA to be displaced from the reservoir into a 7 mm. glass tube delivery line which passed through the top of the box in the rear and terminated directly over the center of the rabbit belly. A cheesecloth wick inserted in the outlet end of the delivery line made contact with the rabbit belly and facilitated the spreading of the fluid. The wick also prevented the 0.67 cc. dose from being retained in the delivery arm by capillary attraction so that perhaps one, two, or even three doses might be delivered in one large surge. As pointed out previously the 0.67 cc. dose was actually applied during a 30 to 45 minute interval due to capillary resistance in the delivery tube.

The rabbits were immobilized in what was essentially a straight jacket. This device consisted of 4 glass tubes, one-half inch in diameter and 24 inches long threaded through two pieces of heavy duck, which were of sufficient length to be carried around the rabbit's body at shoulder and hip girdle levels. The rods were fastened to the duck about 2 inches apart so that 2 rods supported the back and one ran along each flank. The loose ends of duck were rolled together and held securely with 1 inch C clamps. In this jacket the rabbit could kick freely and move its neck and head but escape and self inflicted injury were impossible. The rabbits were placed on their backs so that the thin skin of the belly would be in position to receive the dose. Two such automatic dosing devices were made to accomodate the twenty rabbits under treatment. A third box without the dosing arrangement was used to subject the ten control animals to the same type of restraint over the 16 hour

daily test period. The controls were also clipped so that they would be subjected to similar chances of contracting pneumonia from temperature changes while in the relatively hairless state. All rabbits were immobilized by 5:00 P. M. daily at which time the treatment was started. They were removed the next morning at 9 A. M. and returned to their home cages where they received all the water they would drink, and all the Purina rabbit chow entire ration they would eat during their 8 hour stay. In addition they were fed carrots or kale on alternate days. They were weighed and reclipped weekly. Treatment was given for 12 consecutive days followed by 2 days rest and 5 days per week from then on until the 22 treatments were completed. Complete blood counts, including red and white cell counts, hemoglobin determinations and differential white cell counts were made 20 days before treatment, after the 14th treatment, and two days after the last treatment on all surviving. The gross pathology on autopsy was noted and portions of the adrenal, kidney, liver, lung, spleen, and testicle were taken for histological examination. Near the end of the study urinalyses were made on representative rabbits and finally, when sacrificed, the contents of the bladder were removed for this examination.

Results

Tables 5-127 to 5-129 give in detail weight losses at death or upon sacrificing, gross and micropathology, blood urea nitrogen determinations and blood counts.

The abnormally high weight loss in the treated as well as the untreated control rabbits is due to the fact that all the rabbits were deprived of food and water for 16 hours out of 24. When the study was initiated it was considered as rush work and treatment was therefore continued without interruption for 12 consecutive days. It is probable that if the week ends had been omitted that weight losses would have been in part restored. The rabbits did not increase their food intake during the 8 hour period in the home cages to make up weight loss even though every care was

given to increase their food consumption. The weight losses for the controls paralleled that of the treated animals all through the 22 days of treatment. The average weight loss for the 4 treated animals surviving 22 daily applications was 875 grams and for the 9 controls 742 grams. These weight losses, therefore, are not attributed to the toxicity of the material but to lack of sufficient time to consume adequate food in their weakened condition.

The gross pathology seen at autopsy was of importance in judging skin damage as the sections of skin sent to the pathologist for interpretation were unsatisfactorily prepared due to difficulty in cutting. After a treatment period of 7 days the skins had a dry, leathery, fishscale like appearance with moderate erythema. Following the 12th day of treatment and 2 days of rest the erythema subsided. The skin was scaly and true desquamation was taking place making visible skin of normal appearance beneath it. After the 18th treatment there was still some desquamation but no irritation. This apparently indicates that after the initial response the subsequent epithelial cells are more resistant to the action of BCA.

Of the 16 deaths occurring during the course of the study, there were three which could be attributed to extraneous causes. There were two cases of pneumonic infection, and one case of spinal injury. The mortality was, therefore, about 75% of the normal animals treated. One control animal died of intestinal intussusception, and a parasitic infection of the liver.

Of the 9 animals that died during the first 12 consecutive days of treatment 7 had bloody urine at autopsy which was attributed to gross kidney damage as the micropathology indicates. The occurrence of liver infections in about 40% of the treated and control animals is a condition which cannot be predicted before the animal is used. This is a common finding in rabbits and apparently if not too advanced it interferes very little with their normal life. BCA causes kidney damage primarily

and the occurrence of somewhat weakened livers is therefore relatively unimportant. The finding of parasites in the mesenteries is also of little import since they were all walled off in lymph sacs and seemed to be in an inactive state.

Micropathology of the kidney was a consistent finding and appeared in varying degrees of severity. In the four survivors the pathology was of the nature of cloudy swelling of the convoluted tubules with a like effect in the loop tubules of three of these. In the animals dying toxic deaths this was intensified and in several there was definite tubular degeneration. Pathology of other organs is so mild that it is classed as secondary. Spleens of animals that died showed evidence of blood destruction. About 50% of the livers showed moderate or marked cloudy swelling.

Blood urea nitrogen values for rabbits range normally from 10 to 30 mgm.%. From experience with other materials when a value of 90 to 100 mgm.% is achieved death ensues. This statement is verified by the findings in this study. However, high blood urea nitrogen values cannot always be correlated with severely damaged kidneys since cloudy swelling was the most extreme damage reported for the kidneys of the rabbits that had values over 100 mgm.% urea nitrogen just previous to death. High values on cadaver blood are unreliable although they are suggestive in view of the relatively low value (43.8 mgm.%) found in the one control animal and the high values found in some of those treated (> 100 mgm.%). On the other hand moderately severe kidney pathology may be present and the blood urea nitrogen value may stay well within the normal range. It was not anticipated that deaths would ensue so rapidly and therefore no attempt was made to follow blood urea nitrogen values during the first few days of treatment. The results of such testing would probably have had added significance if it had been done, as it was during this interval that the more susceptible rabbits died. They showed severe kidney pathology and the

characteristic bloody urine which is positive evidence of kidney damage when traumatic injury is ruled out.

The blood counts are summarized in Table 5-126 and show very little variation between control and treated rabbits. The hemoglobin values on the 22 day treated survivors is definitely below the normal range for rabbits. This finding correlates with the micropathology found in the spleens but control animals show the same effect and therefore this finding must be attributed to the unnatural curtailment of food and activity and not to toxicity of BCA.

Table 5-126

Summary of Blood Counts on Rabbits Treated with 3.2 grams per kilogram of Butyl "Carbitol" Acetate Daily.

Rabbit No.	R.B.C.	Hbg.	W.B.C.	Neut.	Lymph.	Mono.	Net Result
18426A	–	0	+	–	0	+	
18427A	0 +	0 –	+ +	+ +	– –	+ –	Low Hbg.
18429A	0	0	–	+	–	–	
18435A	0	0	+	+	–	–	
18440A	– +	0	+ –	–	+	+	Low Hbg.
18441A	–	0	+				
18444A	0 0	0 –	0 +	– +	+ –	+ –	Low Hbg.
18446A	–	0	+	–	+	+	
18449A	–	0	+	–	0	+	
18455A	0 +	+ –	+ –	+ +	– –	– –	Low Hbg.
18423A	– +	0 –	+ –	– –	+ +	+ 0	Low Hbg.
18424A	+ –	0 –	+ +	+ +	– –	+ –	Low Hbg.
18437A	– +	0 –	+ –	+ +	– –	+ 0	Low Hbg.
18438A	0 0	+ –	+ 0	+ +	– –	+ –	Low Hbg.
18442A	–	0	+	0	0	+	
18445A	0	0	0	–	0	–	
18448A	0	+	+	+	–	+	

+, –, denote at least 10% change from the previous count.
0, denotes no change or less than 10% from previous count.
For days on which counts were made see Table 5-129.

Charles P. Carpenter

June 10, 1952

Urinalyses were performed on survivors after the 18th day of treatment and again on urine taken at autopsy. Specific gravity, albumen and sugar were normal. No casts were found. However, bloody urine from early deaths revealed the presence of granular casts.

Summary

Twenty rabbits were treated with butyl "Carbitol" acetate under conditions which approximated the severest military use that could be anticipated. Treatment was made by means of an automatic dosing device which delivered the repellent to the rabbit belly at 100 minute intervals during 16 hours of each day.

A total of 22 daily treatments were made which resulted in a mortality of 75% of the rabbits during this period.

Micropathology of internal organs revealed that butyl "Carbitol" acetate produces injury chiefly in the kidney. Blood urea nitrogen was determined during treatment and at death or sacrifice. Blood counts and urinalyses were performed with essentially negative findings. Weight changes were followed and gross pathology of all animals was recorded for correlation with micropathology.

Butyl "Carbitol" acetate penetrates the rabbit skin readily, and causes kidney pathology when a divided daily dosage of 0.277 cc. per square inch is applied to 13.5% of the body area of rabbits. This is an average of 3.2 cc. per kilo of body weight or about 7 times the amount estimated for the most severe military use.

The use of 7% of corn oil in the butyl "Carbitol" acetate did not prevent development of severe skin injury.

*Death due to infection

Charles P. Carpenter

Charles P. Carpenter
INDUSTRIAL FELLOW

June 26, 1942-abc

Table 5-127

Gross Results of Repeated Daily Treatment of Rabbit Skin with Butyl "Carbitol" Acetate and Pathology of Internal Organs After a Dosage of 3.2 grams per Kilogram Daily

Rabbit No.	Weight in Grams	Days Treated	Fate	Weight Change at Death	Gross Pathology	Micropathology
18427A	2587	22	S	- 731	SKD	A,Kw,L,LU,S,T
18440A	2797	22	S	-1084	SKDE	A,KWX,L,LU,S,T
18444A	2936	22	S	- 810	SKd	A,KWX,L,LU,S,T
18455A	2980	21	S	- 849	Lf,SKd	KWXcg,L,LU,S
18441A	2670	19	D	-1090	SKd	A,KWX,L,LU,S
18426A	2908	17	D*	- 460	LUQ	
18429A	2300	15	S	- 599	KC,LV	A,KWX,L,LU,S,TB
18449A	2468	15	D	- 734	KC,Lv,MET	A,KWX,Lw,LU,S,T
18446A	2709	14	D	- 993	KC,LV,SKed	A,KWXc,Lw,LU,Sc,T
18435A	2965	13	D*	- 865	Lv,LUt,MET	A,KW,Lwc,LUQ,S,T
18454A	2612	11	D	- 788	AC,KC,LC,LUc,MET,SKEF,UB	A,KWc,LW,LU,Sc,T
18425A	2534	10	D	- 984	AC,KC,LUC,SKEFD	AW,LW,LUc,Sc,T
18447A	2456	10	D	- 754	AC,KC,LV,SKf	A,KWX,LW,LUc,Scaf
18450A	2245	9	D	- 563	AC,KC,LCv,SKEF,UB	A,KcWX,LW,LUc,Scaf,T
18456A	2358	9	D	- 528	AC,KC,LV,LUh,Q,UB	A,KcR,LUc,Sc,T
18451A	2794	8	D	- 894	Lc,MET,STh,UB	A,KcWXzG,Lw,LU,Sc
18452A	2676	8	D	- 740	AC,LV,SKEN,UB	Aw,KcWX,Lw,LU,Sc,T
18434A	2218	7	D	- 516	Kc,LA,SKDF,Q,UB	A,KcZ,LW,LU,Scf,T
18439A	2981	6	D	- 835	KC,LUh,SKEf,UB	HB,KcZ,L,Scf,T
18453A	2304	6	D*	- 504	AC,Lj,Q	KWX,LW,LU,ScA,T

Average Weight Loss for 22 day Treated Survivors - 875 grams.

CONTROLS		Days Restrained				
18423A	2534	22	S	- 806		A,K,L,LU,S,T
18437A	2376	22	S	- 438		A,K,L,LU,S,T
18438A	2452	22	S	- 614		K,L,LU,S
18442A	2981	22	S	- 893		A,K,L,LU,S,T
18445A	2591	22	S	- 719		A,K,L,LU,S
18448A	2516	22	S	- 508	Lv,	A,K,L,LU,S,T
18424A	2604	21	S	-1219	LUCq	A,Kw,L,LU,Sf,T
18657	2316	19	D*	- 710	IS,LV	A,K,L,LU,S,T
18659	2600	14	S	- 471	LV	A,K,L,LU,S,T
18669	2341	14	S	- 405	LV	A,K,L,LU,S,T

Average Weight Loss for 22 day Restrained Survivors - 742 grams.

*Death due to infection of lung or trauma.

L. Liver, [illegible]

Lc " , [illegible]

[illegible]

Key to Abbreviations in Table 5-127

Column	Symbol	Meaning
Fate	D	Died
	S	Survived
Micropathology		(Initial capitals for organs, followed by small letters for slight or capitals for marked effect)
	A	Adrenal, normal
	Aw	" , cloudy swelling of cortex
	H	Heart, normal
	Hb	" , blood clots in cavities
	K	Kidney, normal
	Kc	" , congested
	Kg	" , dilation of glomerular capillaries
	Kr	" , necrosis of entire cortex
	Kw	" , cloudy swelling of convoluted tubules
	Kx	" , " " " loop "
	Kz	" , nuclear degeneration of convoluted tubules
	L	Liver, normal
	Lc	" , congested
	Lw	" , cloudy swelling
	LU	Lung, normal
	LUc	" , congested
	LUq	" , pneumonia
	S	Spleen, normal
	Sa	" , splenocytes prominent or increased
	Sc	" , congested
	Sf	" , pigment phagocytized or deposited
	T	Testicle, normal
	TB	" , sperm absent
		(Normal organs not mentioned)
Gross Pathology	Ac	Adrenal, congested
	Is	Intestine, intussusception
	Kc	Kidney, congested
	La	Liver, acini prominent
	Lc	" , congested
	Lf	" , incipient cirrhosis
	Lj	" , jaundiced
	Lv	" , infected or infested

(continued)

Key to Abbreviations in Table 5-127 (cont'd)

Column	Symbol	Meaning
Gross Pathology	LUc	Lung, congested
	LUh	" , hemorrhage
	LUq	" , pneumonic infection
	LUt	" , consolidation
	MEt	Mesentery, tape worms (encysted)
	Q	Paralysis, before death
	SK	Skin, desquamation
	SKe	" , erythema
	SKf	" , fish scale appearance
	SKn	" , necrosis
	Sth	Stomach, petechial hemorrhage

Table 5-129

Blood Counts on Rabbits Treated with 3.2 grams per Kilogram of Butyl "Carbitol" Acetate Daily

Treated Rabbit No.	Days before and during Treatment	R.B.C. Millions	Hbg. gm./100ml.	W.B.C. Thousands	Neutro.	Lympho.	Mono.	Eosino.	Baso.
18426A	- 20	6.35	12.6	9.6	19	70	7	1	3
	+ 14	5.35	12.0	20.92	8	76	14	1	1
18427A	- 20	6.10	11.8	8.12	20	66	8	3	3
	+ 14	5.93	12.2	12.96	24	58	13	1	4
	+ 24	6.90	9.2	15.60	40	50	7	1	2
18429A	- 20	5.50	10.6	10.04	28	59	9	2	2
	+ 14	5.05	11.6	8.10	59	33	6	0	2
18435A	- 20	5.82	12.4	8.04	22	63	12	1	2
	+ 24	5.63	12.2	17.32	55	29	9	2	5
18440A	- 20	6.85	12.4	6.44	-	-	-	-	-
	+ 14	5.03	12.6	16.96	39	54	5	1	1
	+ 24	5.97	9.0	14.48	23	61	13	2	1
18441A	- 20	7.50	12.4	8.32	-	-	-	-	-
	+ 14	5.10	12.0	19.08	23	67	8	0	2
18444A	- 20	6.40	12.2	9.96	34	48	11	4	3
	+ 14	5.75	11.8	9.36	10	76	13	0	1
	+ 24	5.10	8.0	14.56	39	48	8	3	2
18446A	- 20	8.85	12.6	8.20	22	66	10	1	1
	+ 14	5.85	13.8	15.00	8	79	12	0	1
18449A	- 20	7.25	11.8	8.08	22	65	10	1	2
	+ 14	6.27	13.0	16.60	15	69	13	1	2
18455A	- 20	6.17	11.8	5.52	20	70	10	0	0
	+ 14	6.18	13.6	15.08	30	58	8	1	3
	+ 24	7.45	10.4	13.28	57	31	5	2	5

Control Rabbit No.	Days before and during Restraint	R.B.C Millions	Hbg. gm./100ml.	W.B.C. Thousands	Neutro.	Lympho.	Mono.	Eosino.	Baso.
18423A	- 20	5.85	11.0	8.32	31	56	9	2	2
	+ 14	5.05	11.0	15.84	27	60	11	1	1
	+ 24	5.90	8.8	13.08	18	67	12	1	2
18424A	- 20	5.60	12.4	7.60	30	62	6	2	0
	+ 14	6.97	13.0	18.76	36	46	16	1	1
	+ 24	5.99	8.2	21.68	76	16	3	3	2
18437A	- 20	6.40	12.0	8.44	26	62	9	1	2
	+ 14	5.20	11.8	17.72	32	54	10	2	2
	+ 24	6.90	8.4	15.68	41	38	11	2	8
18438A	- 20	5.28	10.4	10.16	7	80	11	0	2
	+ 14	5.05	11.8	12.96	21	63	14	2	0
	+ 24	5.30	8.8	12.16	32	56	9	1	2
18442A	- 20	6.85	12.0	11.56	21	70	7	1	1
	+ 14	5.17	10.8	21.42	19	68	11	0	2
18445A	- 20	7.23	12.6	11.04	34	54	11	0	1
	+ 14	6.45	13.6	10.96	28	58	8	4	2
18448A	- 20	6.68	11.4	7.16	22	66	9	1	2
	+ 14	6.45	13.0	15.60	30	56	11	2	1

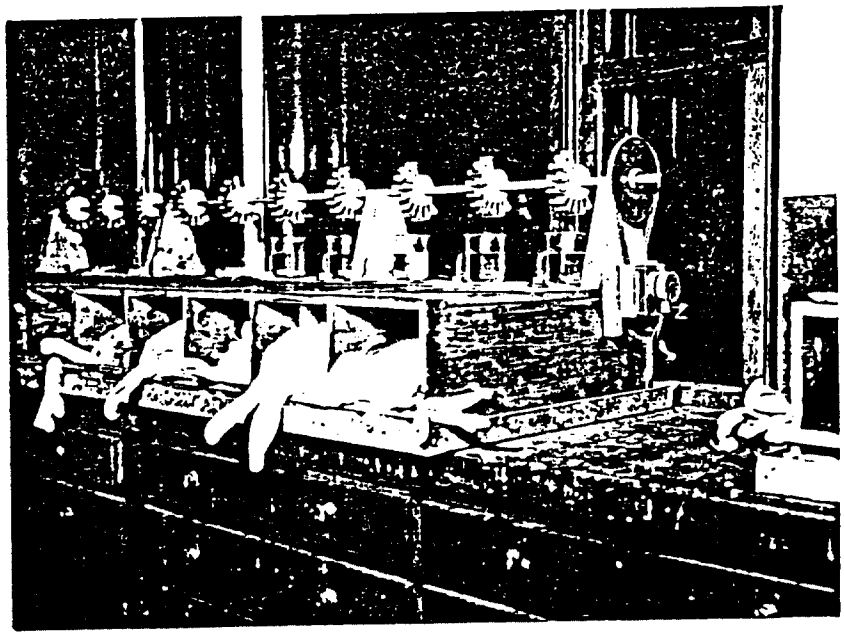

Fig. 1

Automatic delivery device for dosing ten rabbits simultaneously with insect repellents at stated time intervals.

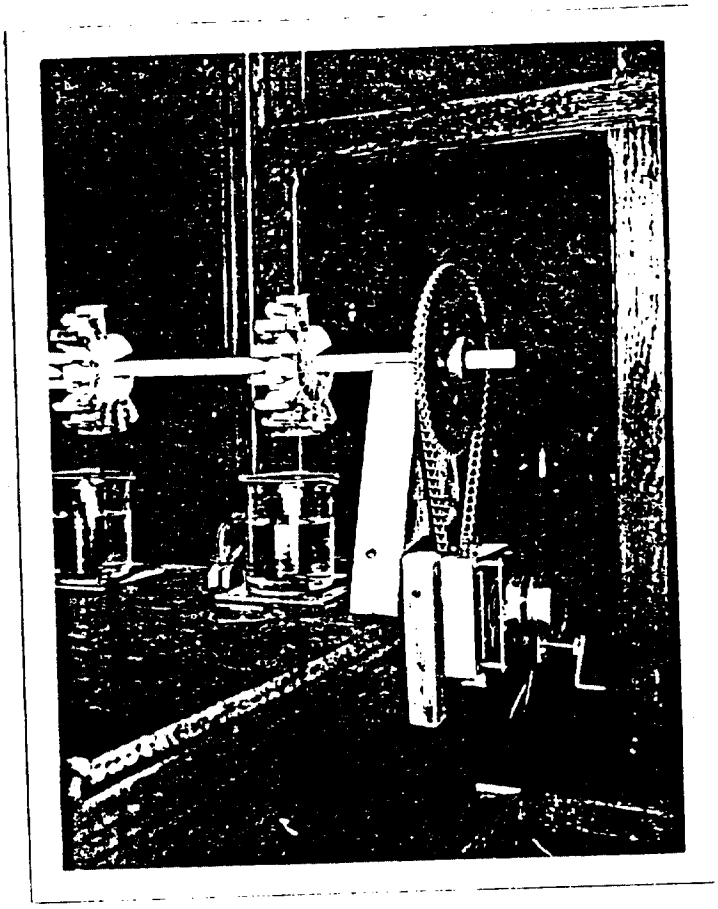

Fig. 2

Close view of automatic delivery mechanism showing the constant speed electric clock which drives the line shaft one revolution in 24 hours. The glass slugs fall from the feeding device into the sidearm reservoir containing the fluid repellent, displacing it into the delivery tube which carries it to the rabbit belly.

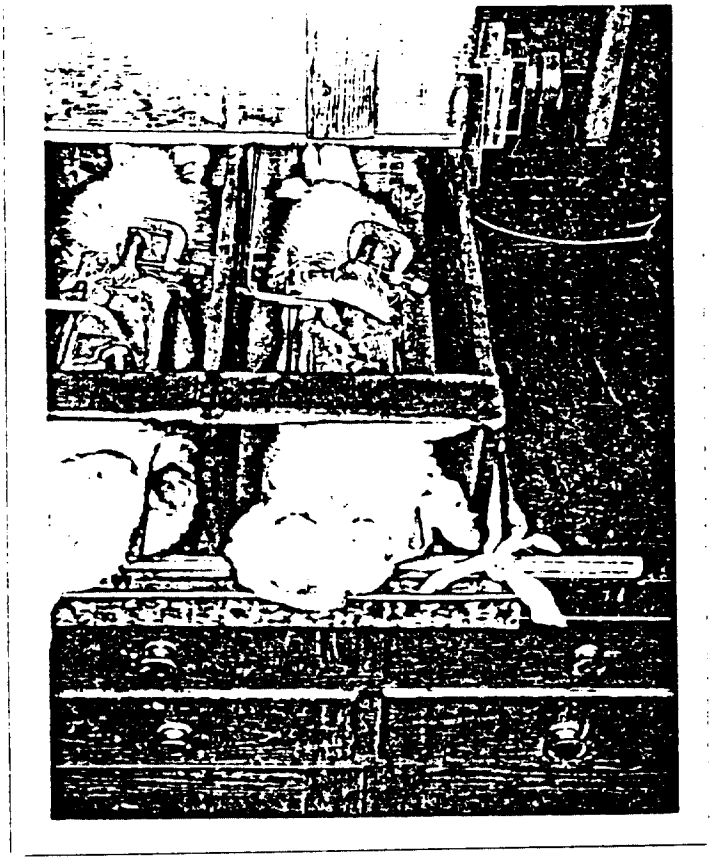

Fig. 3

Two rabbits immobilized in straight jackets in position for receiving doses of insect repellent at stated time intervals. Delivery tube leading from reservoir and wick for spreading fluid are visible over center of rabbit belly.

UNITED STATES ENVIRONMENTAL PROTECTION AGENCY
WASHINGTON, D.C. 20460

William C. Kuryla, Ph.D.
Associate Director, Product Safety
Union Carbide Corporation
39 Old Ridgebury Road
Danbury, Connecticut 06817-0001

OFFICE OF
PREVENTION, PESTICIDES AND
TOXIC SUBSTANCES

MAY 0 8 1995

EPA acknowledges the receipt of information submitted by your organization under Section 8(e) of the Toxic Substances Control Act (TSCA). For your reference, copies of the first page(s) of your submission(s) are enclosed and display the TSCA §8(e) Document Control Number (e.g., 8EHQ-00-0000) assigned by EPA to your submission(s). Please cite the assigned 8(e) number when submitting follow-up or supplemental information and **refer to the reverse side of this page for "EPA Information Requests"** .

All TSCA 8(e) submissions are placed in the public files unless confidentiality is claimed according to the procedures outlined in Part X of EPA's TSCA §8(e) policy statement (43 FR 11110, March 16, 1978). Confidential submissions received pursuant to the TSCA §8(e) Compliance Audit Program (CAP) should already contain information supporting confidentiality claims. This information is required and should be submitted if not done so previously. To substantiate claims, submit responses to the questions in the enclosure "Support Information for Confidentiality Claims". This same enclosure is used to support confidentiality claims for non-CAP submissions.

Please address any further correspondence with the Agency related to this TSCA 8(e) submission to:

Document Processing Center (7407)
Attn: TSCA Section 8(e) Coordinator
Office of Pollution Prevention and Toxics
U.S. Environmental Protection Agency
Washington, D.C. 20460-0001

EPA looks forward to continued cooperation with your organization in its ongoing efforts to evaluate and manage potential risks posed by chemicals to health and the environment.

Sincerely,

Terry R. O'Bryan

Terry R. O'Bryan
Risk Analysis Branch

Enclosure

1244/A

Triage of 8(e) Submissions

Date sent to triage: 12/14/95

NON-CAP CAP

Submission number: 12441 A

TSCA Inventory: Y N D

Study type (circle appropriate):

Group 1 - Dick Clements (1 copy total)

ECO AQUATO

Group 2 - Ernie Falke (1 copy total)

ATOX SBTOX SEN w/NEUR

Group 3 - Elizabeth Margosches (1 copy each)

STOX CTOX EPI RTOX GTOX

STOX/ONCO CTOX/ONCO IMMUNO CYTO NEUR

Other (FATE, EXPO, MET, etc.): _____

Notes:

THIS IS THE ORIGINAL 8(e) SUBMISSION; PLEASE REFILE AFTER TRIAGE DATABASE ENTRY

For Contractor Use Only

entire document: 0 1 2 **pages** 1,2 **pages** 1,2, tab

Notes:

Contractor reviewer : UPS **Date:** 4/11/95

CECATS\TRIAGE TRACKING DBASE ENTRY FORM

CECATS DATA:
Submission # 8EHQ- 0992 -12441 SEQ. A

TYPE: (INT) SUPP FLWP

SUBMITTER NAME: Union Carbide Corporation

INFORMATION REQUESTED: FLWP DATE:
0501 NO INFO REQUESTED
0502 INFO REQUESTED (TECH)
0503 INFO REQUESTED (VOL ACTIONS)
0504 INFO REQUESTED (REPORTING RATIONALE)
DISPOSITION:
(0639) REFER TO CHEMICAL SCREENING
(0678) CAP NOTICE

VOLUNTARY ACTIONS:
(0401) NO ACTION REPORTED
0402 STUDIES PLANNED/UNDERWAY
0403 NOTIFICATION OF WORKERS/USERS
0404 LABEL/MSDS CHANGES
0405 PROCESS/HANDLING CHANGES
0406 APP./USE DISCONTINUED
0407 PRODUCTION DISCONTINUED
0408 CONFIDENTIAL

SUB. DATE: 09/24/92 OTS DATE: 09/29/92 CSRAD DATE: 05/01/95

CHEMICAL NAME: Acetate Carbitol, Butyl

CAS# 124-17-4

INFORMATION TYPE:		P F C
0201	ONCO (HUMAN)	01 02 04
0202	ONCO (ANIMAL)	01 02 04
0203	CELL TRANS (IN VITRO)	01 02 04
0204	MUTA (IN VITRO)	01 02 04
0205	MUTA (IN VIVO)	01 02 04
0206	REPRO/TERATO (HUMAN)	01 02 04
0207	REPRO/TERATO (ANIMAL)	01 02 04
0208	NEURO (HUMAN)	01 02 04
0209	NEURO (ANIMAL)	01 02 04
0210	ACUTE TOX. (HUMAN)	01 02 04
0211	CHR. TOX. (HUMAN)	01 02 04
0212	ACUTE TOX. (ANIMAL)	01 02 04
[redacted]	SUB ACUTE TOX (ANIMAL)	[redacted]
0214	SUB CHRONIC TOX (ANIMAL)	01 02 04
0215	CHRONIC TOX (ANIMAL)	01 02 04

INFORMATION TYPE:		P F C
0216	EPI/CLIN	01 02 04
0217	HUMAN EXPOS (PROD CONTAM)	01 02 04
0218	HUMAN EXPOS (ACCIDENTAL)	01 02 04
0219	HUMAN EXPOS (MONITORING)	01 02 04
0220	ECO/AQUA TOX	01 02 04
0221	ENV. OCCC/REL/FATE	01 02 04
0222	EMER INCI OF ENV CONTAM	01 02 04
0223	RESPONSE REQEST DELAY	01 02 04
(0224)	PROD/COMP/CHEM ID	01 02 04
0225	REPORTING RATIONALE	01 02 04
0226	CONFIDENTIAL	01 02 04
0227	ALLERG (HUMAN)	01 02 04
0228	ALLERG (ANIMAL)	01 02 04
0239	METAB/PHARMACO (ANIMAL)	01 02 04
0240	METAB/PHARMACO (HUMAN)	01 02 04

INFORMATION TYPE:		P F C
0241	IMMUNO (ANIMAL)	01 02 04
0242	IMMUNO (HUMAN)	01 02 04
0243	CHEM/PHYS PROP	01 02 04
0244	CLASTO (IN VITRO)	01 02 04
0245	CLASTO (ANIMAL)	01 02 04
0246	CLASTO (HUMAN)	01 02 04
0247	DNA DAM/REPAIR	01 02 04
(0248)	PROD/USE/PROC	01 02 04
0251	MSDS	01 02 04
0299	OTHER	01 02 04

TRIAGE DATA:

NON-CBI INVENTORY: (YES) / NO / IN TERMINI

ONGOING REVIEW: YES (DROP/REFER) / NO (CONTINUE) / REFER

SPECIES: RBT

TOXICOLOGICAL CONCERN: LOW / MED / (HIGH)

USE: insect repellent

PRODUCTION:

CAS SR

COMMENTS: Rabbits received the test matin (insect repellent) at 0.28 per kg. inch. applied to 13.5% of the body area rabbits. Mortality and severe kidney damage were observed after 12 day 3 treatment (repeated doses at 100 minutes intervals).
It is difficult to assess no NOAEL.